

### **ABSTRACT OF THE DISCLOSURE**

1           A computer hardware configuration for performing the pseudo-spectral time-domain (PSTD)  
2 method on data. The hardware configuration includes a forward fast Fourier transform (FFT) unit  
3 that calculates a forward fast Fourier transform (FFT) from the data, and a complex multiplication  
4 unit that receives the FFT-processed data and calculates a spatial derivative in the frequency domain  
5 from the FFT-processed data. The hardware configuration further includes an inverse fast Fourier  
6 transform (IFFT) unit that converts the spatial derivative in the frequency domain from the complex  
7 multiplication unit into the time domain, and a computation engine that solves a PSTD equation  
8 based upon the spatial derivative in the time domain received from the IFFT unit.